

UNITED STATES PATENT APPLICATION

FOR

**GAMING DEVICE WITH WILD ACTIVATION SYMBOLS
AND WILD TERMINATION SYMBOLS**

INVENTORS:

**ANTHONY J. BAERLOCHER
JOSEPH E. KAMINKOW
PAULINA GLAVICH**

Prepared by:
Bell, Boyd & Lloyd LLC
70 West Madison Street
Suite 3300
Chicago, Illinois 60602
(312) 372-1121
Our File No.: 112300-739

0905447002 * 092601

S P E C I F I C A T I O N

TITLE

5 **"GAMING DEVICE WITH WILD ACTIVATION SYMBOLS AND
WILD TERMINATION SYMBOLS"**

CROSS REFERENCE TO RELATED APPLICATIONS

This application relates to the following co-pending commonly owned patent applications: "GAMING DEVICE HAVING TRANSFORMABLE WILD SYMBOLS OR CARDS WITH WILD SIGNAL INDICATORS," Serial No. _____, Attorney Docket No. 112300-734; "GAMING DEVICE HAVING WILD INDICATORS," Serial No. _____, Attorney Docket No. 0112300-738; and "GAMING DEVICE HAVING SYMBOLS WITH TRANSFORMATION PROBABILITIES," Serial No. _____, Attorney Docket No. 0112300-806.

15

BACKGROUND OF THE INVENTION

Gaming devices are well known. Many known gaming devices provide wild symbols or wild cards. Wild symbols provide a player with an additional opportunity to obtain winning combinations. The use of wild symbols, wild cards or wild indicators in gaming devices provide additional excitement and entertainment for players.

In a slot machine having reels, a wild symbol can enable the matching of symbols along a payline to achieve a combination. For example, in a three reel slot machine, the symbols along a payline on the first, second and third reels may be, respectively, a heart, a heart and a wild symbol. If, in the 25 gaming scheme, the gaming device awards a player for a three heart combination, the wild symbol substitutes for a heart and provides the player with that combination.

In a video poker game, a wild symbol substitutes for a card. For example, in a five card draw poker gaming machine where the gaming device

displays five cards, the cards can be a 10, Jack, Queen, King and wild card. The wild card substitutes as an Ace and provides the player with a winning combination.

- Wild cards have been employed in gaming devices in other manners.
- 5 For example, U.S. Patent No. 5,431,408 discloses a gaming device having a video poker gaming scheme. A player is dealt a hand consisting of five cards. The player is also given a wild card. The wild card is separate from the dealt hand. The player can reserve the wild card for use with a subsequent hand. Thus, the player can use the wild card in a hand in which it is most 10 advantageous to do so.

In another example, U.S. Patent No. 6,089,977 discloses a gaming device having a roaming wild symbol. More specifically, the patent discloses a gaming device having a set of virtual reels. The reels display a set of symbols. Certain symbol combinations serve as triggering events. When one of these 15 combinations occur on the reels, a wild card symbol appears on the reels in the form of a graphical image and moves along the reels. As the wild card symbol moves from one symbol or location to adjacent symbols or locations, the symbols transform into the wild card symbol. After each move of the wild card symbol, the gaming device determines and pays the player for any 20 winning combination which is the result of the transformation. When the wild card symbol moves to the next adjacent symbol, the symbol previously transformed reverts to its original state.

To increase player enjoyment and excitement, it is desirable to provide 25 gaming devices having new and different wild symbol, wild indicator and wild card schemes.

SUMMARY OF THE INVENTION

The present invention provides a gaming device including a set of reels. The reels include symbols. One of the symbols is a wild activation symbol. A 30 player uses conventional control features to activate or spin the reels. If a wild activation symbol is displayed within a display device of the gaming device on an active payline, in a predetermined position, or in a predetermined position

on an active payline, the processor causes the other displayed symbols to sequentially become wild. The processor can also cause the wild activation symbol to be wild. When a wild activation symbol occurs, the processor randomly selects one of the other displayed symbols to be a wild termination 5 symbol. The processor sequentially causes the symbols to become wild until such wild termination symbol is reached. At this point, the processor stops any symbols from becoming wild at or beyond the position in which the wild termination symbol is displayed. It should be appreciated that the transformation process can be repeated one or more times as predetermined 10 or as randomly determined by the processor.

In one embodiment, the gaming device provides a set of symbols on a set of reels. A plurality of the symbols are displayed by a display device. The processor determines which of the symbols will be the wild activation symbol and which of the symbols will be the wild termination symbol. The processor 15 makes the determination when the reels are activated. The specific symbol may be chosen randomly or may be chosen in a predetermined manner. The wild activation symbol and wild termination symbol are not immediately distinguishable from the other symbols in the set of symbols. The processor sequentially transforms symbols displayed within the display device into wild 20 symbols beginning with the wild symbol and ending with the wild termination symbol. Thus, the processor prevents the transformation of symbols into wild symbols beyond a certain position within the display device occupied by the wild termination symbol.

In one embodiment, one or both of the wild activation symbol and wild 25 termination symbol are fixed or distinguished from the other symbols. In an example, the gaming device includes a set of reels having a plurality of symbols such as hearts, cherries, and other suitable symbols. The reels include at least one wild activation symbol. A player activates the reels using a control feature of the gaming device. A plurality of the symbols, including the 30 wild activation symbol, are selectively displayed within the display device. The processor causes symbols within the display device to become wild sequentially. The symbols may become wild in a particular direction or in a

random sequence. When the display device displays a wild activation symbol, the processor randomly determines which of the displayed symbols will be the wild termination symbol. The processor stops symbols from becoming wild beyond the position of the symbol which is determined to be the wild 5 termination symbol.

- It should also be appreciated that the reels could, in an alternative embodiment, include one or more fixed wild activation symbols and one or more fixed wild termination symbols on the reels. In this case, each set of wild activation symbols and wild termination symbols are independently utilized.
- 10 The processor is also capable of causing only the wild activation symbol or the wild termination symbol on the reels. If a wild termination symbol is displayed by itself, it does not effect the outcome. If a wild activation symbol is displayed without a wild termination symbol, it causes one, a plurality, or all of the other symbols to become wild (i.e., without termination). If a wild activation symbol 15 and a wild termination symbol are displayed, the symbols successively turn wild until reaching the wild termination symbol as described above.

It should be appreciated that the present invention could be employed in other primary games, such as video poker as described below and in bonus or secondary games.

- 20 It is therefore an advantage of the present invention to provide a gaming device having wild activation symbols and wild termination symbols.

Other objects, features and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheets of drawings, wherein like numerals refer to like parts, 25 elements, components, steps and processes.

BRIEF DESCRIPTION OF THE FIGURES

- Figs. 1A and 1B are perspective views of alternative embodiments of the gaming device of the present invention;
- 30 Figs. 2 is a schematic block diagram of the electronic configuration of one embodiment of the gaming device of the present invention.

Figs. 3A, 3B, 3C and 3D are front elevation views of a display device in which a wild activation symbol and wild termination symbol are displayed on a set of reels.

5 Figs. 4A, 4B, 4C and 4D are front elevation views of a display device in which a wild activation symbol and wild termination symbol are displayed on a set of reels.

Figs. 5A, 5B, 5C, 5D and 5E are front elevation views of a display device in which a wild activation symbol and wild termination symbol are displayed on a set of reels.

10 Figs. 6A, 6B, 6C, 6D and 6E are front elevation views of a display device in which a wild activation symbol and a wild termination symbol are displayed on a set of reels.

15 Figs. 7A, 7B, 7C and 7D are front elevation views of a display device in which symbols displayed on a set of reels serve as a wild activation symbol and a wild termination symbol.

Figs. 8A, 8B and 8C are front elevation views of a display device displaying a set of cards having a wild activation symbol and a wild termination symbol.

20 Figs. 9A, 9B and 9C are front elevation views of a display device displaying a set of cards having a wild activation symbol and a wild termination symbol.

Figs. 10A, 10B and 10C are front plan views of a display device displaying a set of cards in which a certain card occupies a wild activation position and a certain card occupies a termination position.

25

DETAILED DESCRIPTION OF THE INVENTION

Gaming Device and Electronics

Referring now to the drawings, and in particular to Figs. 1A and 1B, gaming device 10a and gaming device 10b illustrate two possible cabinet styles and display arrangements and are collectively referred to herein as gaming device 10. The present invention includes the game, described below, being a stand alone game or a bonus or secondary game that coordinates with

a base game. When the game of the present invention is a bonus game, gaming device 10 in one base game can be a slot machine having the controls, displays and features of a conventional slot machine, or a video card game such as poker, blackjack, etc. The player can operate the gaming 5 device while standing or sitting. Gaming device 10 also includes being a pub-style or table-top game (not shown), which a player operates while sitting.

The base games of the gaming device 10 include slot, poker, or blackjack. The gaming device 10 also embodies any bonus triggering events, 10 bonus games as well as any progressive game coordinating with these base games. The symbols and indicia used for any of the base, bonus and progressive games include mechanical, electrical or video symbols and indicia.

In a stand alone or a bonus embodiment, the gaming device 10 includes monetary input devices. Figs. 1A and 1B illustrate a coin slot 12 for coins or tokens and/or a payment acceptor 14 for cash money. The payment acceptor 15 14 also includes other devices for accepting payment, such as readers or validators for credit cards, debit cards or smart cards, tickets, notes, etc. When a player inserts money in gaming device 10, a number of credits corresponding to the amount deposited is shown in a credit display 16. After 20 depositing the appropriate amount of money, a player can begin the game by pulling arm 18 or pushing play button 20. Play button 20 can be any play activator used by the player which starts any game or sequence of events in the gaming device.

As shown in Figs. 1A and 1B, gaming device 10 also includes a bet display 22 and a bet one button 24. The player places a bet by pushing the 25 bet one button 24. The player can increase the bet by one credit each time the player pushes the bet one button 24. When the player pushes the bet one button 24, the number of credits shown in the credit display 16 decreases by one, and the number of credits shown in the bet display 22 increases by one. At any time during the game, a player may "cash out" by pushing a cash out 30 button 26 to receive coins or tokens in the coin payout tray 28 or other forms of payment, such as an amount printed on a ticket or credited to a credit card, debit card or smart card.

Gaming device 10 also includes one or more display devices. The embodiment shown in Fig. 1A includes a central display device 30, and the alternative embodiment shown in Fig. 1B includes a central display device 30 as well as an upper display device 32. The display devices display any visual representation or exhibition, including but not limited to movement of physical objects such as mechanical reels and wheels, dynamic lighting and video images. The display device includes any viewing surface such as glass, a video monitor or screen, a liquid crystal display or any other static or dynamic display mechanism. In a video poker, blackjack or other card gaming machine embodiment, the display device includes displaying one or more cards.

The slot machine base game of gaming device 10 preferably displays a plurality of reels 34, preferably three to five reels 34, in mechanical or video form on one or more of the display devices. Each reel 34 displays a plurality of indicia such as bells, hearts, fruits, numbers, letters, bars or other images which preferably correspond to a theme associated with the gaming device 10. If the reels 34 are in video form, the display device displaying the video reels 34 is preferably a video monitor. Each base game, especially in the slot machine base game of the gaming device 10, includes speakers 36 for making sounds or playing music.

Referring now to Fig. 2, a general electronic configuration of the gaming device 10 for the stand alone and bonus embodiments described above preferably includes: a processor 38; a memory device 40 for storing program code or other data; a central display device 30; an upper display device 32; a sound card 42; a plurality of speakers 36; and one or more input devices 44. The processor 38 is preferably a microprocessor or microcontroller-based platform which is capable of displaying images, symbols and other indicia such as images of people, characters, places, things and faces of cards. The memory device 40 includes random access memory (RAM) 46 for storing event data or other data generated or used during a particular game. The memory device 40 also includes read only memory (ROM) 48 for storing program code, which controls the gaming device 10 so that it plays a particular game in accordance with applicable game rules and pay tables.

As illustrated in Fig. 2, the player preferably uses the input devices 44 to input signals into gaming device 10. In the slot machine base game, the input devices 44 include the pull arm 18, play button 20, the bet one button 24 and the cash out button 26. A touch screen 50 and touch screen controller 52 are 5 connected to a video controller 54 and processor 38. The terms "computer" or "controller" are used herein to refer collectively to the processor 38, the memory device 40, the sound card 42, the touch screen controller and the video controller 54.

In certain instances, it is preferable to use a touch screen 50 and an 10 associated touch screen controller 52 instead of a conventional video monitor display device. The touch screen enables a player to input decisions into the gaming device 10 by sending a discrete signal based on the area of the touch screen 50 that the player touches or presses. As further illustrated in Fig. 2, the processor 38 connects to the coin slot 12 or payment acceptor 14, 15 whereby the processor 38 requires a player to deposit a certain amount of money in to start the game.

It should be appreciated that although a processor 38 and memory device 40 are preferable implementations of the present invention, the present invention also includes being implemented via one or more application-specific 20 integrated circuits (ASIC's), one or more hard-wired devices, or one or more mechanical devices (collectively referred to herein as a "processor"). Furthermore, although the processor 38 and memory device 40 preferably reside in each gaming device 10 unit, the present invention includes providing some or all of their functions at a central location such as a network server for 25 communication to a playing station such as over a local area network (LAN), wide area network (WAN), Internet connection, microwave link, and the like.

With reference to the slot machine base game of Figs. 1A and 1B, to operate the gaming device 10, the player inserts the appropriate amount of tokens or money in the coin slot 12 or the payment acceptor 14 and then pulls 30 the arm 18 or pushes the play button 20. The reels 34 then begin to spin. Eventually, the reels 34 come to a stop. As long as the player has credits

remaining, the player can spin the reels 34 again. Depending upon where the reels 34 stop, the player may or may not win additional credits.

Wild Activation and Wild Termination Symbols

Referring now to Fig. 3A, a display device 30 displays a plurality of reels 34. The reels include a plurality of symbols 60 such as hearts, cherries, numbers, or any other suitable symbols. Any of the symbols on the reels may function as or be a wild activation symbol. Thus, the wild activation symbol can be any symbol and is not immediately distinguishable from the other symbols. The processor randomly selects which of the symbols will be the wild activation symbol and displays the wild activation symbol to the player. The processor then sequentially transforms one or more of the other symbols 60 on the reels into wild symbols.

For example, a player activates or spins the reels using the control features of the gaming device. After at least one, a plurality or all of the reels 15 stop spinning, a wild activation symbol may be displayed within the display device. In Figs. 3B-3D, the processor determines that a BAR symbol 60f which is not immediately distinguishable from the other symbols and is displayed within the display device on the second reel 34b will be the wild activation symbol. The processor causes other symbols to become wild in a 20 horizontal direction. Thus, the "7" symbol 60g displayed on the third reel 34c becomes a wild symbol 65a as illustrated in Fig. 3B and any award is determined by the processor and provided to the player. Then, that symbol changes back to a "7" and the cherry symbol 60h on the first reel 34a becomes a wild symbol 65b as illustrated in Fig. 3C. Subsequently, the heart symbol 60j 25 on the second reel 34b becomes a wild symbol 65c as illustrated in Fig 3D.

When the processor selects a symbol to be the wild activation symbol, the processor also selects a symbol to be the wild termination symbol. The wild termination symbol is also initially indistinguishable from the other symbols. In this example, the processor chooses the heart symbol 60k on the 30 third reel 34c to be the wild termination symbol. After the processor changes symbol 60k, into a wild symbol and determines any associated awards, the processor stops changing further symbols into wild symbols. It should be

appreciated that when the processor chooses a symbol as the wild activation symbol or the wild termination symbol, for which there are duplicate symbols, the only symbols which function as the wild activation symbol and the wild termination symbol are those symbols selected at the specific positions within

5 the display device.

The processor determines if the wild activation symbol and the wild termination symbol will occur during a reel spin in a random or predetermined manner after the reels are activated. If the processor determines that a wild activation symbol will occur or be displayed within the display device, the

10 processor also determines, in a random or predetermined manner, where the wild termination symbol will occur or be displayed, if at all, within the display device.

The gaming device provides a signal to a player that each symbol is transformed into a wild symbol. An example is the displaying of a symbol in

15 the form of the word "WILD." In yet another example, a speaker emits a sound or message indicating the card is wild. In an embodiment in which the reels are mechanical, a backlight can be used to illuminate symbols which become wild. Any other audio or visual method of notification is also contemplated for the video or mechanical embodiments.

In another embodiment, the wild activation symbol and wild termination are fixed on the reels and immediately distinguished from the other symbols on the reels. In an example, the display device 30 displays three reels 34a, 34b and 34c, as illustrated in Fig. 4A. After the reels are spun, the top position on the first reel 34a displays a wild activation symbol 62 in the form of a sun symbol. The processor causes the symbols displayed within the display device to sequentially become wild. In this example, the other symbols become wild in a horizontal direction. As a result, the BAR symbol 60b on the second reel 34b becomes a wild symbol 65a as illustrated in Fig. 4B and the processor determines any awards. Next, that symbol changes back and the heart symbol 60c on the third reel 34c becomes a wild symbol 65b as illustrated in Fig. 4C and the processor determines any awards. The processor continues to transform symbols into wild symbols along the middle

row of the display device. As a result, the heart symbol 60e on the first reel 34a subsequently becomes a wild symbol 65c as illustrated in Fig. 4D. The wild termination symbol 64 represented by the "X" in the middle position of the second reel. Accordingly, the processor stops further symbols from becoming
5 wild in the horizontal direction beyond the position which the termination symbol occupies.

In another embodiment, the processor transforms symbols into wild symbols in a vertical direction within the display device. For example, a display device 30 displays three reels as shown in Fig. 5A. After the reels are
10 spun, the second reel 34b displays a wild activation symbol in the form of a cherry symbol 60b. The third reel 34c displays a wild termination symbol in the form of a diamond symbol 60k. The processor transforms the "7" symbol 60f on the second reel into a wild symbol 65a as illustrated in Fig. 5B and the processor determines any award. Next, that symbol changes back and the
15 cherry symbol 60j on the second reel is transformed into a wild symbol 65b as illustrated in Fig. 5C and the processor determines any award. The heart symbol 60c on the third reel then becomes a wild symbol 65c as illustrated in Fig. 5D and the processor determines any award. Next, the "7" symbol 60g on the third reel 34c becomes a wild symbol 65d as illustrated in Fig. 5E and the
20 processor determines any award. The processor then stops further symbols from becoming wild in a vertical direction beyond the position the wild termination symbol occupies.

In one embodiment, the processor transforms symbols into wild symbols in a circular direction within the display device when the wild activation symbol and wild termination symbol are present within the display device. For example, the display device displays three reels 34a, 34b and
25 34c, and after the reels are spun or activated, a wild activation symbol 62 is displayed on the second reel as illustrated in Fig. 6A. A wild termination symbol 64 is displayed on the first reel 34a. The processor transforms the "7" symbol 60k displayed on the third reel into a wild symbol 65a as illustrated in Fig. 6B and the processor determines any award. Next, that symbol changes back and the BAR symbol 60g displayed on the third reel 34c then becomes a

wild symbol 65b as illustrated in Fig. 6C. The heart symbol 60c on the third reel then becomes a wild symbol 65c as illustrated in Fig. 6D. The BAR symbol 60b on the second reel 34b then becomes a wild symbol 65d as illustrated in Fig. 6E. The processor stops further symbols from becoming wild 5 in the circular direction beyond the position which the wild termination symbol 64 occupies.

It should be appreciated that the processor can cause symbols to become wild in any direction, (i.e., horizontally, vertically, diagonally) when a wild activation symbol is displayed within the display device. It should also be 10 appreciated, that, when the processor transforms symbols in a particular direction and comes to an end of a reel or row, further transformations can occur on non-adjacent reels or rows. In an example, if the processor causes the top row of reels to become wild in a horizontal direction, the transformations can then continue along the bottom row of reels.

15 In one embodiment, the processor transforms other symbols into wild symbols in a random sequence (i.e., not along a predetermined path or direction) when the wild activation symbol and wild termination symbol are displayed within the display device 30. For example, after the reels are spun, a wild activation symbol 62 appears in a top position of the display device on 20 the first reel 34a, as illustrated in Fig. 7A. The wild termination symbol 64 appears in a middle position of the display device on the second reel 34b. The processor randomly causes the BAR symbol 60k appearing on the third reel 34c to become a wild symbol 65a as illustrated in Fig. 7B and the processor determines any award. That symbol changes back and the processor 25 randomly selects the BAR symbol 60e on the first reel 34a to become wild as illustrated in Fig. 7C. That symbol changes back and the processor randomly selects the heart symbol 60c on the third reel to become wild as illustrated in Fig. 7D. The processor prevents further transformations of symbols into wild symbols when the processor chooses to transform a symbol in the position 30 occupied by the wild termination symbol.

It should be appreciated that in alternative embodiments, the processor can cause one or more wild activation symbols on the reels within the display

device. It should be also appreciated that the processor can cause one or more related wild termination symbols on the reels within the display device. As a result, the display device may display one or more sets of symbols which are transformed into wild symbols. The sets can transform simultaneously or 5 successively. Thus, for example, if two sets of a wild activation symbol and a related wild termination symbol appear, each set will be independently utilized.

In a further embodiment, one or more wild activation symbols and one or more wild termination symbols are fixed on the reels. The processor may determine whether to display the wild activation symbol, the wild termination 10 symbol, or both. If a wild termination symbol alone occurs, no symbols are changed into wild symbols. If a wild activation symbol and a wild termination symbol are displayed, the symbol transforms into wild symbols as described above. If a wild activation symbol occurs without a wild termination symbol, one, plurality, or all of the displayed symbols can transform into wild symbols.

15 In one embodiment of the present invention, the gaming device and specifically one or more of the reels (or cards as described below) will include natural or dedicated wild symbols which function in a conventional manner. If a transformation process occurs when one of these natural wild symbols are displayed on one or more of the reels, the transformation in one embodiment 20 causes the natural wild symbol to become a modifier such as a multiplier which multiplies or otherwise modifies the award, if any, provided to the player. It should be appreciated that the natural wild symbol could alternatively transform into other modifiers such as one or more free games, more bonus games or bonus game triggers, or one or more repeats of the transformation 25 process. It should also be appreciated that the processor could selectively or randomly determine to transform the natural wild symbol.

It should be appreciated that the present invention could be employed in other primary or bonus games. For instance, in one embodiment, the display device displays a set of cards in a video poker game. The processor randomly 30 determines which, if any, cards will include a wild activation symbol and a wild termination symbol. For example, referring now to Fig. 8A, five cards 80a through 80e are displayed within the display device 30. A first card 80a

displays a wild activation symbol 82. The wild activation symbol may be any symbol suitable for use by a gaming device. The processor causes the second card 80b to become a wild card 85a as illustrated in Fig. 8B and the processor determines if any award should be provided to the player. That card 5 changes back and the third card 80c becomes a wild card 85b as illustrated in Fig. 8C.

In another example, a fourth card 80d in a set of cards displays a wild activation symbol 82 as illustrated in Fig. 9A. The second card 80b displays a wild termination symbol 84. The processor causes the fifth card 80e to 10 become wild as illustrated in Fig. 9B. Next, the first card 80a becomes wild as illustrated in Fig. 9C. The second card 80b displays a termination symbol 84. The processor stops any other cards from becoming wild when it reaches the card position displaying the wild termination symbol.

In another embodiment, the processor randomly determines a wild 15 activation position within a set of cards displayed on the display device. The processor causes other cards to become wild in correlation to the wild activation position. A wild termination position is also determined within the set of cards displayed on the display device. The processor stops cards from becoming wild beyond the wild termination position.

20 In an example, the display device 30 displays five cards 80a through 80e, as illustrated in Fig. 10A. Prior to dealing the cards, the processor determines the first card position 80a to be the wild activation position. The processor also determines the fourth card position 80d to be a wild termination position. The processor then successively transforms the second and third 25 cards into wild cards 85a and 85b, as illustrated in Figs. 10B and 10C. The processor prevents any other cards from transforming into wild cards beyond the fourth card position. It should be appreciated that the processor can alternatively transform the cards into wild cards in a random sequence.

In another embodiment, the processor can determine the wild activation 30 position based on a type of card displayed. For example, the processor can determine that the wild activation position will be any position in which a King, if any, is displayed. The processor then determines a wild termination position

based on a second type of card. For example, the processor determines that a card displaying a diamond, if any, will correlate to a wild termination position. It is appreciated that the individual determinations of a wild activation position and wild termination position can be dependent or completely independent of 5 each other. For example, the wild activation position may be determined by the suit of the card while the wild termination position may be determined by the numerical value of the card.

It should also be appreciated that the processor could randomly provide a wild termination symbol without a wild activation symbol and vice versa. It 10 should also be appreciated that the player could be allowed or required to hold a wild activation symbol or wild termination symbol.

While the present invention is described in connection with what is presently considered to be the most practical and preferred embodiments, it should be appreciated that the invention is not limited to the disclosed 15 embodiments, and is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the claims. Modifications and variations in the present invention may be made without departing from the novel aspects of the invention as defined in the claims, and this application is limited only by the scope of the claims.